SEQUENCE LISTING

<110> KIKKOMAN CORPORATION

<120> LUCIFERASE AND A METHOD FOR DETECTING INTRACELLULAR ATP
      USING THE SAME

<130> P98-0634

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<150> JP97/361022
<151> 1997-12-26

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<170> PatentIn Ver. 2.0

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ttt tac cct att gaa gag gga tct gct gga gca caa ttg cgc aag tat   96
Phe Tyr Pro Ile Glu Glu Gly Ser Ala Gly Ala Gln Leu Arg Lys Tyr
       20   25   30

atg gat cga tat gca aaa ctt gga gca att gct ttt act aac gca ctt   144
Met Asp Arg Tyr Ala Lys Leu Gly Ala Ile Ala Phe Thr Asn Ala Leu
       35   40   45

acc ggt gtc gat tat acg tac gcc gaa tac tta gaa aaa tca tgc tgt   192
Thr Gly Val Asp Tyr Thr Tyr Ala Glu Tyr Leu Glu Lys Ser Cys Cys
       50   55   60

cta gga gag gct tta aag aat tat ggt ttg gtt gtt gat gga aga att   240
Leu Gly Glu Ala Leu Lys Asn Tyr Gly Leu Val Val Asp Gly Arg Ile
 65   70   75   80

gcg tta tgc agt gaa aac tgt gaa gaa ttc ttt att cct gta tta gcc   288
Ala Leu Cys Ser Glu Asn Cys Glu Glu Phe Phe Ile Pro Val Leu Ala
       85   90   95

ggt tta ttt ata ggt gtc ggt gtg gct cca act aat gag att tac act   336
Gly Leu Phe Ile Gly Val Gly Val Ala Pro Thr Asn Glu Ile Tyr Thr
      100   105   110

cta cgt gaa ttg gtt cac agt tta ggc atc tct aag cca aca att gta   384
Leu Arg Glu Leu Val His Ser Leu Gly Ile Ser Lys Pro Thr Ile Val
   115   120   125

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ttt agt tct aaa aaa gga tta gat aaa gtt ata act gta caa aaa acg     432
Phe Ser Ser Lys Lys Gly Leu Asp Lys Val Ile Thr Val Gln Lys Thr
    130              135              140

gta act gct att aaa acc att gtt ata ttg gac agc aaa gtg gat tat     480
Val Thr Ala Ile Lys Thr Ile Val Ile Leu Asp Ser Lys Val Asp Tyr
145              150              155              160

aga ggt tat caa tcc atg gac aac ttt att aaa aaa aac act cca caa     528
Arg Gly Tyr Gln Ser Met Asp Asn Phe Ile Lys Lys Asn Thr Pro Gln
                 165              170              175

ggt ttc aaa gga tca agt ttt aaa act gta gaa gtt aac cgc aaa gaa     576
Gly Phe Lys Gly Ser Ser Phe Lys Thr Val Glu Val Asn Arg Lys Glu
             180              185              190

caa gtt gct ctt ata atg aac tct tcg ggt tca acc ggt ttg cca aaa     624
Gln Val Ala Leu Ile Met Asn Ser Ser Gly Ser Thr Gly Leu Pro Lys
             195              200              205

ggt gtg caa ctt act cat gaa aat ttg gtc act aga ttt tct cac gct     672
Gly Val Gln Leu Thr His Glu Asn Leu Val Thr Arg Phe Ser His Ala
    210              215              220

aga gat cca att tat gga aac caa gtt tca cca ggc acg gct att tta     720
Arg Asp Pro Ile Tyr Gly Asn Gln Val Ser Pro Gly Thr Ala Ile Leu
    225              230              235              240

act gta gta cca ttc cat cat ggt ttt ggt atg ttt act act tta ggc     768
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Thr Val Val Pro Phe His His Gly Phe Gly Met Phe Thr Thr Leu Gly
     245   250   255

tat cta act tgt ggt ttt cgt att gtc atg tta acg aaa ttt gac gaa   816
Tyr Leu Thr Cys Gly Phe Arg Ile Val Met Leu Thr Lys Phe Asp Glu
     260   265   270

gag act ttt tta aaa aca ctg caa gat tac aaa tgt tca agc gtt att   864
Glu Thr Phe Leu Lys Thr Leu Gln Asp Tyr Lys Cys Ser Ser Val Ile
     275   280   285

ctt gta ccg act ttg ttt gca att ctt aat aga agt gaa tta ctc gat   912
Leu Val Pro Thr Leu Phe Ala Ile Leu Asn Arg Ser Glu Leu Leu Asp
     290   295   300

aaa tat gat tta tca aat tta gtt gaa att gca tct ggc gga gca cct   960
Lys Tyr Asp Leu Ser Asn Leu Val Glu Ile Ala Ser Gly Gly Ala Pro
     305   310   315   320

tta tct aaa gaa att ggt gaa gct gtt gct aga cgt ttt aat tta ccg   1008
Leu Ser Lys Glu Ile Gly Glu Ala Val Ala Arg Arg Phe Asn Leu Pro
        325   330   335

ggt gtt cgt caa ggc tat ggt tta aca gaa aca acc tct gca att att   1056
Gly Val Arg Gln Gly Tyr Gly Leu Thr Glu Thr Thr Ser Ala Ile Ile
        340   345   350

atc aca ccg gaa ggc gat gat aaa cca ggt gct tct ggc aaa gtt gtg   1104
Ile Thr Pro Glu Gly Asp Asp Lys Pro Gly Ala Ser Gly Lys Val Val

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cca tta ttt aaa gca aaa gtt atc gat ctt gat act aaa aaa act ttg   1152
Pro Leu Phe Lys Ala Lys Val Ile Asp Leu Asp Thr Lys Lys Thr Leu
        370              375                    380
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ggc ccg aac aga cgt gga gaa gtt tgt gta aag ggt cct atg ctt atg   1200
Gly Pro Asn Arg Arg Gly Glu Val Cys Val Lys Gly Pro Met Leu Met
385                    390                    395                    400
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aaa ggt tat gta gat aat cca gaa gca aca aga gaa atc ata gat gaa   1248
Lys Gly Tyr Val Asp Asn Pro Glu Ala Thr Arg Glu Ile Ile Asp Glu
                405              410                    415
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gaa ggt tgg ttg cac aca gga gat att ggg tat tac gat gaa gaa aaa   1296
Glu Gly Trp Leu His Thr Gly Asp Ile Gly Tyr Tyr Asp Glu Glu Lys
                420              425                    430
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cat ttc ttt atc gtg gat cgt ttg aag tct tta atc aaa tac aaa gga   1344
His Phe Phe Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly
                435              440                    445
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tat caa gta cca cct gct gaa tta gaa tct gtt ctt ttg caa cat cca   1392
Tyr Gln Val Pro Pro Ala Glu Leu Glu Ser Val Leu Leu Gln His Pro
                450              455                    460
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aat att ttt gat gcc ggc gtt gct ggc gtt cca gat cct ata gct ggt   1440
Asn Ile Phe Asp Ala Gly Val Ala Gly Val Pro Asp Pro Ile Ala Gly
465                    470                    475                    480
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gag ctt ccg gga gct gtt gtt gta ctt aag aaa gga aaa tct atg act   1488
Glu Leu Pro Gly Ala Val Val Val Leu Lys Lys Gly Lys Ser Met Thr
              485   490   495

gaa aaa gaa gta atg gat tac gtt gct agt caa gtt tca aat gca aaa   1536
Glu Lys Glu Val Met Asp Tyr Val Ala Ser Gln Val Ser Asn Ala Lys
              500   505   510

cgt ttg cgt ggt ggt gtc cgt ttt gtg gac gaa gta cct aaa ggt ctc   1584
Arg Leu Arg Gly Gly Val Arg Phe Val Asp Glu Val Pro Lys Gly Leu
              515   520   525

act ggt aaa att gac ggt aaa gca att aga gaa ata ctg aag aaa cca   1632
Thr Gly Lys Ile Asp Gly Lys Ala Ile Arg Glu Ile Leu Lys Lys Pro
              530   535   540

                                                                   1644
gtt gct aag atg
Val Ala Lys Met
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<210> 4

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<213> Luciola lateralis

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        20   25   30

Met Asp Arg Tyr Ala Lys Leu Gly Ala Ile Ala Phe Thr Asn Ala Leu
        35   40   45

Thr Gly Val Asp Tyr Thr Tyr Ala Glu Tyr Leu Glu Lys Ser Cys Cys
        50   55   60

Leu Gly Glu Ala Leu Lys Asn Tyr Gly Leu Val Val Asp Gly Arg Ile
    65   70   75   80

Ala Leu Cys Ser Glu Asn Cys Glu Glu Phe Phe Ile Pro Val Leu Ala
                85   90   95

Gly Leu Phe Ile Gly Val Gly Val Ala Pro Thr Asn Glu Ile Tyr Thr
            100   105   110

Leu Arg Glu Leu Val His Ser Leu Gly Ile Ser Lys Pro Thr Ile Val
            115   120   125

Phe Ser Ser Lys Lys Gly Leu Asp Lys Val Ile Thr Val Gln Lys Thr
            130   135   140

Val Thr Ala Ile Lys Thr Ile Val Ile Leu Asp Ser Lys Val Asp Tyr
    145   150   155   160

Arg Gly Tyr Gln Ser Met Asp Asn Phe Ile Lys Lys Asn Thr Pro Gln

165   170   175

Gly Phe Lys Gly Ser Ser Phe Lys Thr Val Glu Val Asn Arg Lys Glu
          180   185   190

Gln Val Ala Leu Ile Met Asn Ser Ser Gly Ser Thr Gly Leu Pro Lys
          195   200   205

Gly Val Gln Leu Thr His Glu Asn Leu Val Thr Arg Phe Ser His Ala
          210   215   220

Arg Asp Pro Ile Tyr Gly Asn Gln Val Ser Pro Gly Thr Ala Ile Leu
225   230   235   240

Thr Val Val Pro Phe His His Gly Phe Gly Met Phe Thr Thr Leu Gly
                    245   250   255

Tyr Leu Thr Cys Gly Phe Arg Ile Val Met Leu Thr Lys Phe Asp Glu
                    260   265   270

Glu Thr Phe Leu Lys Thr Leu Gln Asp Tyr Lys Cys Ser Ser Val Ile
          275   280   285

Leu Val Pro Thr Leu Phe Ala Ile Leu Asn Arg Ser Glu Leu Leu Asp
          290   295   300

Lys Tyr Asp Leu Ser Asn Leu Val Glu Ile Ala Ser Gly Gly Ala Pro
305   310   315   320

Leu Ser Lys Glu Ile Gly Glu Ala Val Ala Arg Arg Phe Asn Leu Pro
                325   330   335

Gly Val Arg Gln Gly Tyr Gly Leu Thr Glu Thr Thr Ser Ala Ile Ile
            340   345   350

Ile Thr Pro Glu Gly Asp Asp Lys Pro Gly Ala Ser Gly Lys Val Val
            355   360   365

Pro Leu Phe Lys Ala Lys Val Ile Asp Leu Asp Thr Lys Lys Thr Leu
            370   375   380

Gly Pro Asn Arg Arg Gly Glu Val Cys Val Lys Gly Pro Met Leu Met
385   390   395   400

Lys Gly Tyr Val Asp Asn Pro Glu Ala Thr Arg Glu Ile Ile Asp Glu
                405   410   415

Glu Gly Trp Leu His Thr Gly Asp Ile Gly Tyr Tyr Asp Glu Glu Lys
                420   425   430

His Phe Phe Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly
                435   440   445

Tyr Gln Val Pro Pro Ala Glu Leu Glu Ser Val Leu Leu Gln His Pro
            450   455   460

Asn Ile Phe Asp Ala Gly Val Ala Gly Val Pro Asp Pro Ile Ala Gly
            465   470   475   480

Glu Leu Pro Gly Ala Val Val Val Leu Lys Lys Gly Lys Ser Met Thr
          485   490   495

Glu Lys Glu Val Met Asp Tyr Val Ala Ser Gln Val Ser Asn Ala Lys
          500   505   510

Arg Leu Arg Gly Gly Val Arg Phe Val Asp Glu Val Pro Lys Gly Leu
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Thr Gly Lys Ile Asp Gly Lys Ala Ile Arg Glu Ile Leu Lys Lys Pro
          530   535   540

Val Ala Lys Met
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         1                  5                    10                      15

ttt tac cct att gaa gag gga tct gct gga gca caa ttg cgc aag tat    96
Phe Tyr Pro Ile Glu Glu Gly Ser Ala Gly Ala Gln Leu Arg Lys Tyr
              20                   25                   30

atg gat cga tat gca aaa ctt gga gca att gct ttt act aac gca ctt    144
Met Asp Arg Tyr Ala Lys Leu Gly Ala Ile Ala Phe Thr Asn Ala Leu
         35                   40                   45

acc ggt gtc gat tat acg tac gcc gaa tac tta gaa aaa tca tgc tgt    192
Thr Gly Val Asp Tyr Thr Tyr Ala Glu Tyr Leu Glu Lys Ser Cys Cys
         50                   55                   60

cta gga gag gct tta aag aat tat ggt ttg gtt gtt gat gga aga att    240
Leu Gly Glu Ala Leu Lys Asn Tyr Gly Leu Val Val Asp Gly Arg Ile
         65                   70                   75                   80

gcg tta tgc agt gaa aac tgt gaa gaa ttc ttt att cct gta tta gcc    288
Ala Leu Cys Ser Glu Asn Cys Glu Glu Phe Phe Ile Pro Val Leu Ala
              85                   90                   95

ggt tta ttt ata ggt gtc ggt gtg gct cca act aat gag att tac act    336
Gly Leu Phe Ile Gly Val Gly Val Ala Pro Thr Asn Glu Ile Tyr Thr
              100                  105                  110

cta cgt gaa ttg gtt cac agt tta ggc atc tct aag cca aca att gta    384
Leu Arg Glu Leu Val His Ser Leu Gly Ile Ser Lys Pro Thr Ile Val
         115                  120                  125
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ttt agt tct aaa aaa gga tta gat aaa gtt ata act gta caa aaa acg   432
Phe Ser Ser Lys Lys Gly Leu Asp Lys Val Ile Thr Val Gln Lys Thr
    130   135   140

gta act gct att aaa acc att gtt ata ttg gac agc aaa gtg gat tat   480
Val Thr Ala Ile Lys Thr Ile Val Ile Leu Asp Ser Lys Val Asp Tyr
    145   150   155   160

aga ggt tat caa tcc atg gac aac ttt att aaa aaa aac act cca caa   528
Arg Gly Tyr Gln Ser Met Asp Asn Phe Ile Lys Lys Asn Thr Pro Gln
            165   170   175

ggt ttc aaa gga tca agt ttt aaa act gta gaa gtt aac cgc aaa gaa   576
Gly Phe Lys Gly Ser Ser Phe Lys Thr Val Glu Val Asn Arg Lys Glu
            180   185   190

caa gtt gct ctt ata atg aac tct tcg ggt tca acc ggt ttg cca aaa   624
Gln Val Ala Leu Ile Met Asn Ser Ser Gly Ser Thr Gly Leu Pro Lys
            195   200   205

ggt gtg caa ctt act cat gaa aat atc gtc act aga ttt tct cac gct   672
Gly Val Gln Leu Thr His Glu Asn Ile Val Thr Arg Phe Ser His Ala
    210   215   220

aga gat cca att tat gga aac caa gtt tca cca ggc acg gct att tta   720
Arg Asp Pro Ile Tyr Gly Asn Gln Val Ser Pro Gly Thr Ala Ile Leu
    225   230   235   240

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act gta gta cca ttc cat cat ggt ttt ggt atg ttt act act tta ggc    768
Thr Val Val Pro Phe His His Gly Phe Gly Met Phe Thr Thr Leu Gly
            245                 250                 255


tat cta act tgt ggt ttt cgt att gtc atg tta acg aaa ttt gac gaa    816
Tyr Leu Thr Cys Gly Phe Arg Ile Val Met Leu Thr Lys Phe Asp Glu
            260                 265                 270


gag act ttt tta aaa aca ctg caa gat tac aaa tgt tca agc gtt att    864
Glu Thr Phe Leu Lys Thr Leu Gln Asp Tyr Lys Cys Ser Ser Val Ile
            275                 280                 285


ctt gta ccg act ttg ttt gca att ctt aat aga agt gaa tta ctc gat    912
Leu Val Pro Thr Leu Phe Ala Ile Leu Asn Arg Ser Glu Leu Leu Asp
            290                 295                 300


aaa tat gat tta tca aat tta gtt gaa att gca tct ggc gga gca cct    960
Lys Tyr Asp Leu Ser Asn Leu Val Glu Ile Ala Ser Gly Gly Ala Pro
305                 310                 315                 320


tta tct aaa gaa att ggt gaa gct gtt gct aga cgt ttt aat tta ccg    1008
Leu Ser Lys Glu Ile Gly Glu Ala Val Ala Arg Arg Phe Asn Leu Pro
            325                 330                 335


ggt gtt cgt caa ggc tat ggt tta aca gaa aca acc tct gca att att    1056
Gly Val Arg Gln Gly Tyr Gly Leu Thr Glu Thr Thr Ser Ala Ile Ile
            340                 345                 350


atc aca ccg gaa ggc gat gat aaa cca ggt gct tct ggc aaa gtt gtg    1104
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Ile Thr Pro Glu Gly Asp Asp Lys Pro Gly Ala Ser Gly Lys Val Val
     355   360   365

cca tta ttt aaa gca aaa gtt atc gat ctt gat act aaa aaa act ttg   1152
Pro Leu Phe Lys Ala Lys Val Ile Asp Leu Asp Thr Lys Lys Thr Leu
     370   375   380

ggc ccg aac aga cgt gga gaa gtt tgt gta aag ggt cct atg ctt atg   1200
Gly Pro Asn Arg Arg Gly Glu Val Cys Val Lys Gly Pro Met Leu Met
385   390   395   400

aaa ggt tat gta gat aat cca gaa gca aca aga gaa atc ata gat gaa   1248
Lys Gly Tyr Val Asp Asn Pro Glu Ala Thr Arg Glu Ile Ile Asp Glu
                    405   410   415

gaa ggt tgg ttg cac aca gga gat att ggg tat tac gat gaa gaa aaa   1296
Glu Gly Trp Leu His Thr Gly Asp Ile Gly Tyr Tyr Asp Glu Glu Lys
               420   425   430

cat ttc ttt atc gtg gat cgt ttg aag tct tta atc aaa tac aaa gga   1344
His Phe Phe Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly
          435   440   445

tat caa gta cca cct gct gaa tta gaa tct gtt ctt ttg caa cat cca   1392
Tyr Gln Val Pro Pro Ala Glu Leu Glu Ser Val Leu Leu Gln His Pro
     450   455   460

aat att ttt gat gcc ggc gtt gct ggc gtt cca gat cct ata gct ggt   1440
Asn Ile Phe Asp Ala Gly Val Ala Gly Val Pro Asp Pro Ile Ala Gly

1 5 / 2 0

gag ctt ccg gga gct gtt gtt gta ctt aag aaa gga aaa tct atg act   1488
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                485   490   495

gaa aaa gaa gta atg gat tac gtt gct agt caa gtt tca aat gca aaa   1536
Glu Lys Glu Val Met Asp Tyr Val Ala Ser Gln Val Ser Asn Ala Lys
           500   505   510

cgt ttg cgt ggt ggt gtc cgt ttt gtg gac gaa gta cct aaa ggt ctc   1584
Arg Leu Arg Gly Gly Val Arg Phe Val Asp Glu Val Pro Lys Gly Leu
           515   520   525

act ggt aaa att gac ggt aaa gca att aga gaa ata ctg aag aaa cca   1632
Thr Gly Lys Ile Asp Gly Lys Ala Ile Arg Glu Ile Leu Lys Lys Pro
     530   535   540

                                                                      1644
gtt gct aag atg
Val Ala Lys Met
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<210> 6

<211> 548

<212> PRT

<213> Luciola lateralis

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Met Glu Asn Met Glu Asn Asp Glu Asn Ile Val Tyr Gly Pro Glu Pro
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        20   25   30

Met Asp Arg Tyr Ala Lys Leu Gly Ala Ile Ala Phe Thr Asn Ala Leu
        35   40   45

Thr Gly Val Asp Tyr Thr Tyr Ala Glu Tyr Leu Glu Lys Ser Cys Cys
        50   55   60

Leu Gly Glu Ala Leu Lys Asn Tyr Gly Leu Val Val Asp Gly Arg Ile
65   70   75   80

Ala Leu Cys Ser Glu Asn Cys Glu Glu Phe Phe Ile Pro Val Leu Ala
                85   90   95

Gly Leu Phe Ile Gly Val Gly Val Ala Pro Thr Asn Glu Ile Tyr Thr
            100   105   110

Leu Arg Glu Leu Val His Ser Leu Gly Ile Ser Lys Pro Thr Ile Val
            115   120   125

Phe Ser Ser Lys Lys Gly Leu Asp Lys Val Ile Thr Val Gln Lys Thr
            130   135   140

Val Thr Ala Ile Lys Thr Ile Val Ile Leu Asp Ser Lys Val Asp Tyr
145   150   155   160

Arg Gly Tyr Gln Ser Met Asp Asn Phe Ile Lys Lys Asn Thr Pro Gln
                165   170   175

Gly Phe Lys Gly Ser Ser Phe Lys Thr Val Glu Val Asn Arg Lys Glu
                180   185   190

Gln Val Ala Leu Ile Met Asn Ser Ser Gly Ser Thr Gly Leu Pro Lys
                195   200   205

Gly Val Gln Leu Thr His Glu Asn Ile Val Thr Arg Phe Ser His Ala
            210   215   220

Arg Asp Pro Ile Tyr Gly Asn Gln Val Ser Pro Gly Thr Ala Ile Leu
    225   230   235   240

Thr Val Val Pro Phe His His Gly Phe Gly Met Phe Thr Thr Leu Gly
                245   250   255

Tyr Leu Thr Cys Gly Phe Arg Ile Val Met Leu Thr Lys Phe Asp Glu
                260   265   270

Glu Thr Phe Leu Lys Thr Leu Gln Asp Tyr Lys Cys Ser Ser Val Ile
                275   280   285

Leu Val Pro Thr Leu Phe Ala Ile Leu Asn Arg Ser Glu Leu Leu Asp
            290   295   300

Lys Tyr Asp Leu Ser Asn Leu Val Glu Ile Ala Ser Gly Gly Ala Pro

Leu Ser Lys Glu Ile Gly Glu Ala Val Ala Arg Arg Phe Asn Leu Pro
           325   330   335

Gly Val Arg Gln Gly Tyr Gly Leu Thr Glu Thr Thr Ser Ala Ile Ile
           340   345   350

Ile Thr Pro Glu Gly Asp Asp Lys Pro Gly Ala Ser Gly Lys Val Val
           355   360   365

Pro Leu Phe Lys Ala Lys Val Ile Asp Leu Asp Thr Lys Lys Thr Leu
           370   375   380

Gly Pro Asn Arg Arg Gly Glu Val Cys Val Lys Gly Pro Met Leu Met
           385   390   395   400

Lys Gly Tyr Val Asp Asn Pro Glu Ala Thr Arg Glu Ile Ile Asp Glu
           405   410   415

Glu Gly Trp Leu His Thr Gly Asp Ile Gly Tyr Tyr Asp Glu Glu Lys
           420   425   430

His Phe Phe Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly
           435   440   445

Tyr Gln Val Pro Pro Ala Glu Leu Glu Ser Val Leu Leu Gln His Pro
           450   455   460

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Asn Ile Phe Asp Ala Gly Val Ala Gly Val Pro Asp Pro Ile Ala Gly
465                 470                 475                 480

Glu Leu Pro Gly Ala Val Val Val Leu Lys Lys Gly Lys Ser Met Thr
                485                 490                 495

Glu Lys Glu Val Met Asp Tyr Val Ala Ser Gln Val Ser Asn Ala Lys
                500                 505                 510

Arg Leu Arg Gly Gly Val Arg Phe Val Asp Glu Val Pro Lys Gly Leu
                515                 520                 525

Thr Gly Lys Ile Asp Gly Lys Ala Ile Arg Glu Ile Leu Lys Lys Pro
                530                 535                 540

Val Ala Lys Met
545
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